



# Virginia Coastal Zone Management

Spring/Summer 2006



## IN THIS ISSUE

"Got Message?"	2
DEQ Director Outlines Path to Collective Success	5
Virginia CZM Partners Propose Five Year Priorities	6
O Oysters	8
Paddling the Seaside	10
Virginia's Maritime Heritage: The Battle of Hampton Roads	14
Focus on Historic Coastal Places: West Point	18



**Virginia Coastal Zone**  
MANAGEMENT PROGRAM

Protecting, restoring, strengthening our  
coastal ecosystems & economy



# Virginia Coastal Zone Management Program

The Virginia CZM Program is a network of state and local government agencies working to create more vital and sustainable coastal communities and ecosystems. Virginia's coastal zone includes the 29 counties and 17 cities of Tidewater Virginia and all tidal waters out to the three mile territorial sea boundary.

The Virginia CZM Program includes state and local laws and policies to protect and manage Virginia's coastal resources, implemented by:

Virginia Department of Environmental Quality— lead agency  
Virginia Department of Conservation and Recreation  
Virginia Department of Game and Inland Fisheries  
Virginia Department of Health  
Virginia Marine Resources Commission  
Tidewater Local Governments

The Program is guided by the Coastal Policy Team which provides a forum for managing cross-cutting coastal resource issues. The Coastal Policy Team is comprised of the partner agencies listed above as well as:

Virginia Department of Agriculture and Consumer Affairs  
Virginia Department of Forestry  
Virginia Department of Historic Resources  
Virginia Department of Transportation  
Virginia Economic Development Partnership  
Virginia Institute of Marine Science  
Virginia Planning District Commissions (8 Tidewater regions)

The Virginia CZM Program is part of the national coastal zone management program, a voluntary partnership between the National Oceanic and Atmospheric Administration and U.S. coastal states and territories authorized by the Coastal Zone Management Act of 1972, as amended.

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Visit us on the Web at: [www.deq.virginia.gov/coastal/](http://www.deq.virginia.gov/coastal/)

Cover Photo:  
An Oyster Catcher on Virginia's Eastern Shore. Photo by Alex Wilke.  
The Nature Conservancy. See back cover for more details.





# Message from the Program Manager

20 years. 48.8 million dollars. 1,108 grants. 3 program managers. 14 staffers. A staggering amount of time, money and effort. But it's been rewarding, having been with the program for 18 of its 20 years. Only with that much time can we really see any progress. Improvements are often overshadowed by increasing demands on our coastal zone.

But to celebrate our longevity, and the fact that the Virginia Coastal Zone Management Program is no longer a teenager, we created a program logo (see back cover). But the logo does more than celebrate our 20th anniversary. It provides an identity that the public will (we hope) see and connect with who we are and what we do. Without that connection and without the public's support, we may not be able to celebrate any more anniversaries. We hope you like our "new look!"

Along with the new look are some new directions for the VA CZM Program. One of them is toward the world of "social marketing" where we'll try to apply commercial marketing techniques to a social issue - coastal management (see page 2). Despite our efforts, and polls that say people do care about our coastal resources, people's behavior has changed little....perhaps because we aren't using appropriate marketing techniques.

Another direction for us will be "Living Shorelines." Over the next 5 years, we'll target about \$650,000 to make it easier for shoreline property owners to apply erosion mitigation techniques that actually increase habitat and water quality. Sound intriguing? See page 6. So stay with us and let's see if we can do another 20!



*Laura McKay, Manager, Virginia Coastal Zone Management Program.*

## Virginia Coastal Zone Management

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*Front row (left to right) Scott Lerberg, Shep Moon. Back row (left to right) Rachel Bullene, Laura McKay, Virginia Witmer. Kelly Price—see page 20.*



**Virginia Coastal Zone**  
MANAGEMENT PROGRAM

# “Got Message?”

By Virginia Witmer, Outreach Coordinator

Virginia's coastal area has been undeniably attractive for centuries and now supports more than 60 percent of our citizens and our largest cities. This steadily growing population is placing ever increasing pressure on our coastal resources. Despite the lessons learned during recent hurricanes, we continue to build on our shorelines and increase the vulnerability of our communities to future natural hazards. Despite the successes of regulatory and voluntary nutrient reduction programs, we continue to degrade our streams, rivers, the Bay, and ultimately, our ocean.

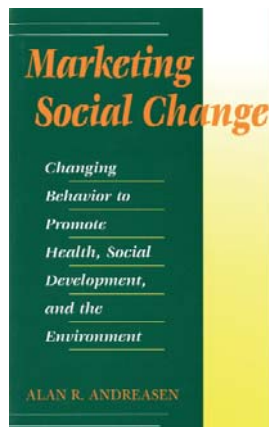
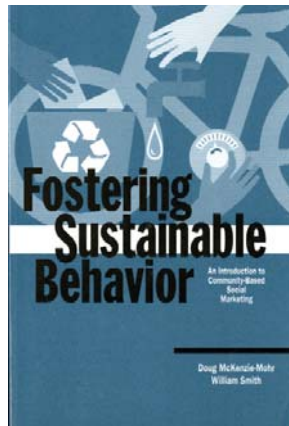
This is a bleak picture. But it does not have to be a snapshot of our future. Coastal stewardship means finding solutions to the problems of today and planning better for tomorrow.

## Changing Behaviors Is Key to Stewardship

Communication and education campaigns have made great strides in spreading awareness about the environmental problems we face. In fact, in a May 2004 survey conducted by the Chesapeake Bay Program, *nine out of ten* of the citizens surveyed reported being aware and concerned about the deterioration of the Bay's health. Almost *half* – 48% – described themselves as “very concerned.” Yet, when it came to the way many residents reported they *behave* – over-fertilizing lawns, neglecting septic tank maintenance and leaving pet waste to flow into the Bay – nothing had changed.

So, why do these and other educated citizens fail to adopt behaviors that they know will have a positive impact on the health of our coast?

It may be message fatigue. It may be a fog of apathy. It may just be inaction. Dr. Doug McKenzie-Mohr, an environmental psychologist, writes in his book *Fostering Sustainable Behavior* that there is a general lack of willingness for most people to significantly alter their behavior for the sake of the environment alone. His research points out that behavior change rarely occurs as a result of simply providing information. As the Bay survey illustrated, understanding what needs to be done does not always lead to a change in behavior and better environmental practices.



## “Selling” Coastal Stewardship Behaviors

McKenzie-Mohr is a pioneer and leader in the rapidly growing field of “community-based social marketing,” which relies on research that shows behavior change can be achieved by removing barriers to an activity, while simultaneously enhancing the benefits to the individual members of a community. Alan Andreasen, author of *Marketing Social Change*, defines social marketing as “the application of marketing technologies developed in the commercial sector to the solution of social problems where the bottom line is behavior change.”

What has made commercial marketers like Nike so successful? The answer: commercial marketers are consumer-focused. They first identify the needs and wants of their target audience and then frame a marketing strategy around this knowledge. Buy a pair of Nikes, *and* get a pair of sneakers that will spring load you towards “adventure” and “vitality.”

In October 2005, the Virginia CZM Program invited Judy Landers, a consultant with the Academy for Educational Development's Center for Behavior Change and one of the engineers of the Chesapeake Club, to speak with coastal resource managers from Maine to Virginia about this new approach to environmental advocacy (see text box on next page.)

She illustrated how to develop a consumer mindset and go beyond raising awareness to affect what people *do* and how social marketing campaigns, like the Chesapeake Club, popularize behaviors to improve the quality of the environment.

## How Are Social Marketing Campaigns Different?

Information campaigns assume the missing ingredient is information and focus on delivering that information,” described Landers. They focus on the message and the product: what can we tell them that will achieve the desired result?

Social marketing campaigns on the other hand do not focus on what people need to know, but focus on learning what people need and want (blue crab on their plates).

Social marketing campaigns ask who must do what differently, what can we offer them in exchange, and what barriers or obstacles are stopping them from doing it. To answer these questions, it is key to talk and listen to the people you are trying to



## The Chesapeake Club

You may have heard the catchy slogan “Save the Crabs... Then Eat ‘Em.” In this new twist, the Bay Program’s Chesapeake Club campaign tries to change how residents behave not by appealing to the environmental reasons not to fertilize in the spring (fertilizer runoff is damaging to the Bay) but because of the culinary and lifestyle implications – most specifically, damage to a tasty regional icon, the Blue Crab. The campaign is unconventional. It steers away from “preachy” messages and introduces a memorable element of humor. (Right) Two of five ads placed in the Washington Post and throughout the Union Station commuter hub and bumper sticker.

reach. Every good marketer knows that you cannot sell to everyone at once. To be most effective, you need to divide your audiences into groups that are as similar to each other as possible and to create messages specifically for each group.

This baseline marketing research is a crucial first step in any successful social marketing campaign. Landers stressed understanding and removing any barriers that prevent your audience from adopting a desired behavior. Barriers may include a lack of awareness, time, energy, money, convenience, or negative perceptions (fear that their lawn will not look as good as the neighbors).

“By doing your research and talking to your targeted audience, you can learn what benefits they value most and what barriers they face or foresee,” stressed Landers. “You can also quantify pre-campaign behavior against which to measure post-campaign behavior change.”

## The Four “Ps”

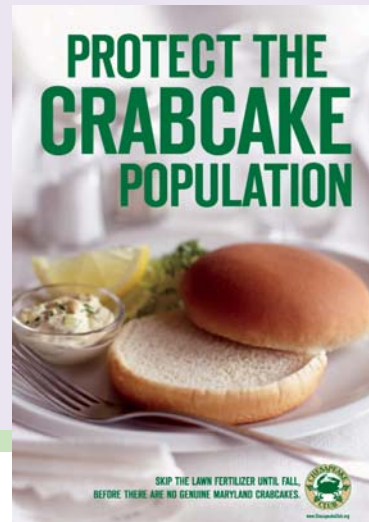
Social marketing campaigns are based on traditional commercial marketing principles and focus on the four “P’s” for success. They are product, price, place and promotion.

### Product

A social marketing campaign treats the desired behavior, e.g. “wait until fall to fertilize,” and its benefits “make sure my seafood keeps coming” as the **product**.

### Price

Like commercial marketing campaigns, social marketing campaigns also require an exchange—giving up an ingrained



behavior in exchange for a valued benefit. The **price** is what the targeted audience must do to obtain the product (change my familiar spring fertilizing ritual). The price cannot exceed the benefits or the perceived value of the product will be low and the behavior will be unlikely to be adopted.

### Place

The next “P” to consider is *place*, which describes where your product reaches your targeted audience. People will not go out of their way to find your message, so it must be placed where your target audience is likely to see it.

The Bay Program wanted to change a behavior taking place at home, so they ran Chesapeake Club ads on TV during morning and late night news as well as on Saturday mornings. Since many of the homeowners were suburban commuters, ads ran in the Washington Post and on kiosks in Union Station. The campaign also enlisted restaurants as partners to reach people at the place where they often enjoy their seafood and to strengthen the connection between seafood and lawn care behavior.

### Promotion

*Promotion* refers to your campaign’s message and how you communicate your message to your targeted audience. “Because of its visibility, this “P” is often mistakenly thought of as compris-

## “Don’t Mess With Texas”

### Knowing Your Audience Really Pays Off!

Not only do 95 percent of Texans know this bold slogan, which was designed to appeal to young males, but it has quickly become an internationally recognized rallying cry. Why? Because the slogan and the campaign advertisements appeal to the intense pride and spirit of Texans. Any Texan crazy about their home state and wanting the world to know it, picks up their candy wrappers, cigarette butts, and fast food and beverage containers.

## “Got Milk?”

### Applying all 4 “Ps” Is Essential!

This well-known milk mustache campaign successfully decreased milk’s fuddy-duddy image. However, milk consumption did not increase. By changing two “Ps” - product and place - milk became a competitor with other beverages and gained new customers. New attractive single-serving packaging and new flavors appeal to more consumers and enhanced accessibility (in soft drink coolers) has made milk a nutritiously hip, grab-and-go option.

D.C. has roughly 530,000 acres of lawn. According to 2002 Bay Program data, an estimated 11% of the total amount of nitrogen loading from this area comes from lawn fertilizer.

The Chesapeake Club campaign door signs and yard signs publicly recognized homeowners who hired a Bay-friendly lawn service.

[www.chesapeakeclub.org](http://www.chesapeakeclub.org)



#### GET IN TOUCH WITH YOUR INNER CHESAPEAKE.

Your grounds are now under the tender care of the Chesapeake Club. Our yard service is specifically designed around the soils and grasses of your Chesapeake Bay watershed and around the impact our work has on the seafood and waterfront many miles away. Like you, we recognize a healthy Chesapeake starts quite literally in our own back yard.

More people than ever are working to protect the Chesapeake. More people are inspecting septic tanks annually, planting larger borders along their lawns and placing rain barrels under their down spouts... actions that keep damaging runoff from harming our seafood and polluting the Chesapeake Bay. Find out what simple things you can do at [www.ChesapeakeClub.org](http://www.ChesapeakeClub.org).

Know folks who haven't yet discovered their place in the Chesapeake watershed? Please take this door hanger and pass it on. And suggest a visit to [www.chesapeakeclub.org](http://www.chesapeakeclub.org) where one can find everything from yard tips to day trips to seafood recipes you will never forget.

The lunch you save may be your own.



[www.ChesapeakeClub.org](http://www.ChesapeakeClub.org)  
Enjoying the Chesapeake Life



Chesapeake Club coasters distributed by local restaurants appealed to the culinary heart of patrons. All graphics courtesy of the CBP.

ing the whole of social marketing, but it is only one piece," stressed Landers. The most effective social marketing strategies use a combination of tools to reach their targeted audience and they pre-test their promotional items on their audience. When a simple, clear message is repeated in many places and formats, it is more likely to be seen and remembered. Consistency and continuity are critical to a successful campaign. Try to stick to one main "look" and slogan, or people may not realize all the pieces are from your campaign.

The Bay Program promoted their spoofed Chesapeake Club message on a website with a "Southern Living" flair, paid T.V., outdoor and newspaper advertisements and free news coverage.

## Get Commitment to That New Behavior

Social marketing experts also strongly suggest securing a freely-volunteered commitment (written or verbal, in public or a group) from your targeted audience to engage in the selected behavior. When individuals agree to a small request, it often alters the way they perceive themselves and the likelihood that they will later act consistently with their new attitude, pointed out Landers. People often forget what behavior is desirable, so provide noticeable, self-explanatory prompts and post them in as close proximity as possible to where the action is to be taken.

Working at the grassroots level and developing a visible community norm were the cornerstones of the Bay Program's social marketing campaign. Neighbors can actually see whether you're waiting until fall to fertilize, and Chesapeake Club yard signs on the lawns of residents using bay-friendly lawn care services served to reinforce the desired behavior. The campaign reframed the issue as a lifestyle, rather than an environmental, matter.

## Consider Unusual Partners

The Chesapeake Club campaign also highlighted the value of another "p" – *partnerships*. Environmental issues are complex and the target audiences vast and varied. Partnering with other agencies or organizations, particularly those with similar goals and within the targeted community, can result in a broader reaching and effective campaign. You can also bring more attention and credibility to a campaign by partnering with key people and organizations.

The Chesapeake Club campaign expanded its reach in the community by teaming up with lawn care services (16% of the targeted audience in the campaign used a lawn service) to market a bay-friendly service option, an alternative product. In return, the companies received free marketing and were listed on the Chesapeake Club website and in advertisements. The campaign received free media coverage when stories appeared highlighting the "weird" partnerships that had formed between environmentalists and lawn services, and the fact that this new approach to an environmental campaign was gaining attention in the area. The campaign also expanded its audience, people "actively enjoying" the Bay, by partnering with local restaurants. The restaurants used the campaign's free drink coasters and wait staff were equipped to answer questions about the campaign. Participating restaurants were also featured on the Chesapeake Club website.

## Know the Competition


Be aware of competing messages pulling on the targeted audience. The product needs to be more attractive than the other alternatives. It might just be inaction, which is easier than adopting a behavior. But other factors can influence an audience's reaction to a program, including political changes and news events that change the context of a message. Work by fellow environmental organizations may also affect how you should portray a message. Watch for these influences and changes and make the necessary adjustments to your campaign.

## Evaluate Early

Evaluation of a program is critical and should occur throughout the campaign. It is important to devote time and resources up front to survey the target audience to measure baseline behavior (so you can measure behavior changes later on) and attitudes (to ascertain perceived barriers and benefits to behavior change and help in designing the campaign). As you develop a campaign, test and refine products, messages and promotional items with the target audience before investing in full program implementation. Invest financial resources wisely. When the campaign is complete,

survey your audience again to measure actual behavior change, and ask “did we make a difference?” Is the target audience engaging in the desired behavior? A successful social marketing campaign takes time—often 3-5 years. Know that you are on track.

One year into the campaign, the Bay Program surveyed the effectiveness of the Chesapeake Club. A post-campaign survey showed that 72 percent of those responding could recall one of the campaign’s themes, e.g., wait until fall to fertilize. Forty-three percent remembered the brand name Chesapeake Club or the tagline; with 50 percent liking the brand and 34 percent liking the tagline (only 1 percent didn’t like it). Thirty-eight percent of people remembered the specific “ask” of the campaign “wait to fertilize until fall” or “don’t fertilize in spring.” Although not statistically significant, 46 percent of those not exposed to the campaign planned to fertilize their lawn in the spring, compared to only 40 percent of those who were exposed to the campaign.

Awareness is a necessary first step but not a direct path to behavior change. In order to truly make the difference, we must change our everyday non-sustainable behaviors. 

## DEQ Director Outlines Path to Collective Success



*In Virginia and across the nation we have seen significant success in the past 30 years in our efforts to clean our air and water*

*David K. Paylor, Director, Virginia Department of Environmental Quality*

*and to improve how we dispose of waste. As we move forward and improve our stewardship of the environment, there are two keys to success: collective responsibility and a focus on results.*

*Collective responsibility involves working together forming partnerships to solve environmental problems and making good stewardship behavior a “mainstream” activity. Through collaboration we can identify our common goals, such as promoting economic growth in a way that enables us to sustain our natural resources. But getting there can be tough.*

*Part of our responsibility is to understand the legitimate concerns of everyone involved in an environmental issue and addressing those concerns to the best of our abilities. It’s the part in social marketing where you take the time to find out what is discouraging the behavior we want and find ways to encourage the behaviors that will protect natural resources.*

*A good example of this is the Virginia Coastal Zone Management Program. The collaboration among federal, state and local governments, as well as other organizations and individuals, has led to many success stories in protecting the coastal zone. We are seeing innovation and hard work pay off, and we will continue to see successes as we meet our shared responsibilities.*

*This leads to an important question: How can we measure our success? I believe the answer will be based on the environmental results we can demonstrate from our actions. We are looking for better tools than the old regulatory, command-and-control approach. We can achieve more results – better results – if we rely less on extensive government regulation and begin to look for more solutions through collaboration, re-design and cooperation.*

*Our goal at DEQ is to improve our environment. This goal belongs to all of us. We have a lot to do, and if we plan well and look to the future we certainly will succeed.*

### Learn More From These Websites

[www.deq.virginia.gov/coastal/neczmpps.htm#social](http://www.deq.virginia.gov/coastal/neczmpps.htm#social)

Download Judy Lander’s presentation “Thinking Like a Marketer to Promote Environmental Changes” and a social marketing plan starter.

[www.cbsm.com](http://www.cbsm.com)

Illustrates how to use community-based social marketing to design and evaluate programs, including a database of articles, reports, graphics, and case studies.

[www.social-marketing.org/](http://www.social-marketing.org/)

Social Marketing Institute - (Institute headed by Alan Andreason from Georgetown University)

[www.greenmediatoolshed.org/](http://www.greenmediatoolshed.org/)

Green Media Toolshed – loaded with environmental social marketing tips, tools, and case studies.

<http://lhsc.usf.edu/medicine/ntcsm/TLM/index.htm>

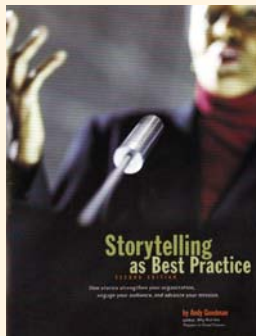
On-line mini course in social marketing.

### Want to Read a Good Story About Telling Better Stories?

“...numbers numb, jargon jars, and nobody ever marched on Washington because of a pie chart.” (Andy Goodman, *Storytelling as Best Practice*)

The ability to tell great stories is a valuable skill. When it comes to capturing attention and galvanizing people to action, stories mean more to the public than numbers.

They are the mainstay of the human experience – they help us remember and to share our experiences and convictions. That is why telling better stories – stories that are compelling, engage the public, and connect Virginians to our coastal resources - is essential to the Virginia CZM Program’s efforts to spread our message of protecting coastal resources. We will be using every opportunity to share a tale or two!





# COASTAL NETWORK IN ACTION

## Virginia CZM Partners Propose Five Year Priorities

By Rachel Bullene, Grants Coordinator

When the Coastal Zone Management Act (CZMA) was reauthorized in 1990, a new program was established to provide voluntary, match-free funding to coastal states to address needs in nine coastal areas: wetlands, coastal hazards, public access, marine debris, cumulative and secondary impacts, special area management planning (SAMPs), ocean resources, energy and government facility siting, and aquaculture.

The National Oceanic and Atmospheric Administration (NOAA), which distributes CZMA funds, requires that coastal states assess changes, progress and new issues in these areas every five years. This assessment ranks the need in each area as high, medium, or low priority. Once the high priority areas have been determined, strategies are developed which must result in new enforceable coastal policies in each area.

The Virginia CZM Program contracted with the University of Virginia's Institute for Environmental Negotiation (IEN) to prepare Virginia's draft Coastal Needs Assessment. Numerous interviews with coastal managers and scientists and an extensive literature and resource review formed the basis for IEN's report to Virginia CZM staff. The assessment was distributed to the Coastal Policy Team (CPT), which ranked as a "high priority"—wetlands, public access, SAMPs, aquaculture, coastal hazards, and cumulative and secondary impacts of growth and development. Three areas—marine debris, energy facility siting, and ocean resources—received a "medium priority" ranking. No area was assigned a low priority by the CPT, reflecting the increasing pressures from growth and urbanization on our coastal resources.

Late last year and early this year, IEN facilitated focus group meetings for more in-depth discussions on four of the high priority areas: coastal hazards, public access, wetlands, and coastal hazards. The focus groups helped sketch out strategies for addressing the needs in these areas. Virginia CZM Program staff solicited comments and drafted strategies for the two remaining high priority areas: aquaculture and SAMPs. The CPT then gathered to review and rank the 12 proposed strategies developed for CZMA Section 309 funding over the next five years.

In March, the Virginia CZM Program submitted its **2006-2011 Coastal Needs Assessment and Strategies** report to NOAA. Preliminary comments from NOAA have suggested that Virginia reduce the number of strategies it funds to focus attention and resources on two or three of the high priority areas. The priority area strategies under consideration are summarized in

## 2006-2011 Draft Coastal Strategies

- Continue to develop the Coastal GEMS internet mapping system to present the best remaining blue and green infrastructure in Virginia's coastal zone.
- Improve shoreline management and promote the use of "Living Shorelines" where appropriate.
- Expand the role of regional Public Access Authorities (PAAs) in Virginia.
- Prioritize regional conservation corridors for preservation and restoration of wetlands and other important coastal lands.
- Improve the management and maintenance of alternative Onsite Wastewater Treatment Systems in coastal localities.

the table above. Pending NOAA's approval, the Virginia CZM Program anticipates receiving approximately \$540,000 each year over the next five years to implement the selected strategies. Details of all strategies, including those summarized below, are available on the Virginia CZM website at [www.deq.virginia.gov/coastal/assess.html](http://www.deq.virginia.gov/coastal/assess.html).

## Public Access Authorities

The local governments of the Middle Peninsula and Northern Neck both have been enabled by the General Assembly to create Public Access Authorities (PAAs). The Middle Peninsula localities created their PAA in 2004 and since that time have been very active in identifying priority sites, leveraging funds and acquiring lands to improve public access in the region. The Northern Neck is just getting started. This successful model would benefit the other 6 regions of the coastal zone and places public access planning where the most expertise exists: at the local/regional level. This strategy will not only support expanding the use of PAAs but will also increase the tools these regional authorities have at their disposal to address public access needs and resolve use conflicts.



The Virginia CZM Program awarded a \$400,000 grant to the Middle Peninsula Public Access Authority to acquire the Browne Tract, shown above. Subsequently, with funds from BFI and prison labor, the PAA built this walking bridge and a nature viewing station. Photo courtesy of MPPDC.



- *Implement the Dragon Run Special Area Management Plan including new zoning and comprehensive plans, sustainable economic development practices, and public access and conservation lands management.*
- *Develop a set of Best Management Practices (BMPs) for shellfish farming for all of Virginia's waters.*
- *Identify suitable areas for shellfish enterprise zones within publicly owned bottom.*
- *Revise the Coastal Primary Sand Dunes and Beaches Act and guidelines to better protect dunes and beaches not included in the Act.*
- *Develop a Seaside Special Area Management Plan for the seaside of Virginia's Shore.*

## Living Shorelines

As waterfront property is developed, the shoreline is often "hardened" with revetments and bulkheads. While these methods provide property owners with erosion protection, they degrade the ability of the shoreline to provide habitat for aquatic life and to filter storm water runoff. Many low energy shorelines are being hardened where less damaging techniques for managing shoreline erosion could be employed.

The goal of this top ranked strategy is to promote "Living Shorelines," a technique that not only stabilizes the shoreline but provides valuable habitat and improves water quality. Strategy components will include: a "Living Shoreline" Summit (*see side bar at lower right*); revisions to the state's Wetlands Guidelines; research to further document the habitat value and refine the design of living shorelines; and, a protocol for determining the feasibility of living shorelines on a reach (shoreline segment) basis. Additional shoreline situation reports and shoreline evolution studies will better inform local shoreline management decisions and a shoreline planning guidance document will help localities to proactively address shoreline management issues and meet the comprehensive planning requirements of the Chesapeake Bay Preservation Act. Finally, a living shoreline brochure and website for landowners and a design manual and training program for contractors will be produced.

## Coastal GEMS

The Virginia CZM Program will continue to build the Coastal Geospatial and Educational Mapping System (Coastal GEMS), an internet based system which will provide access to a wide range of coastal resource maps and data, regulatory information and fact sheets. An important aspect of the strategy would be to secure agreements with federal, state, and local agencies and governments to consult Coastal GEMS at key junctures in land

use planning and permitting processes to better define and promote "appropriate development" and to incorporate this concept into local comprehensive plans and ordinances. The goal will be to foster stronger linkages between local land use policy and state water use policy.

## Aquaculture BMPs and Leasing

Shellfish farming, although positive for the economy and for ecological removal of algae from eutrophied systems, can create negative ecological and aesthetic impacts if not conducted properly. This strategy would complete development of a set of Best Management Practices for oyster, clam and other shellfish farming for all of Virginia's waters, which would be attached to aquaculture or shellfish growing permits.



*The close proximity of clam aquaculture and uplands necessitate that the industry be a strong advocate for responsible development and land-use practices to protect water quality. Photo courtesy of VIMS.*

As restoration of wild oysters remains elusive, it becomes even more important to provide adequate opportunity for production of cultivated shellfish. Scientists, resource managers and industry professionals agree that the public use of our 240,000 acres of public Baylor grounds should be re-evaluated and provision made for "aquaculture enterprise zones." A new leasing or use program(s) will be developed to allow cultivation in those areas. The program will require passage by the General Assembly and designation of the final sites will involve public review. 🐟

*Thanks to Virginia CZM's partners for their work in developing these strategies.*

### Mark Your Calendars!

### Living Shoreline Summit

**December 6 & 7  
Williamsburg, Virginia**

*Review the current status of living shorelines and help develop a plan for promoting the use of this technique!*

*Summit Planning Committee: VA CZM, CBNERRVA, VIMS, NOAA, MD CZM, Chesapeake Bay Trust, Chesapeake Research Consortium, Keith Campbell Foundation, GreenShore Solutions, Maryland Geological Survey and Richmond County (VA).*

**Details on the Summit will soon be available on the Web. Visit [www.deq.virginia.gov/coastall](http://www.deq.virginia.gov/coastall) for a link.**



# O Oysters!

By Laura McKay, Coastal Program

"I weep for you," the Walrus said:  
"I deeply sympathize."  
With sobs and tears he sorted out  
Those of the largest size,  
Holding his pocket-handkerchief  
Before his streaming eyes.  
"O Oysters," said the Carpenter,  
"You've had a pleasant run!  
Shall we be trotting home again?"  
But answer came there none—  
And this was scarcely odd, because  
They'd eaten every one.



From: "The Walrus and the Carpenter" in *Through the Looking-Glass and What Alice Found There*. Written and illustrated in 1872 by Lewis Carroll.

What to do after we've eaten every one? Grow more, of course! "How?" you ask. First get a copy of our new *Virginia Oyster Gardening* guide.

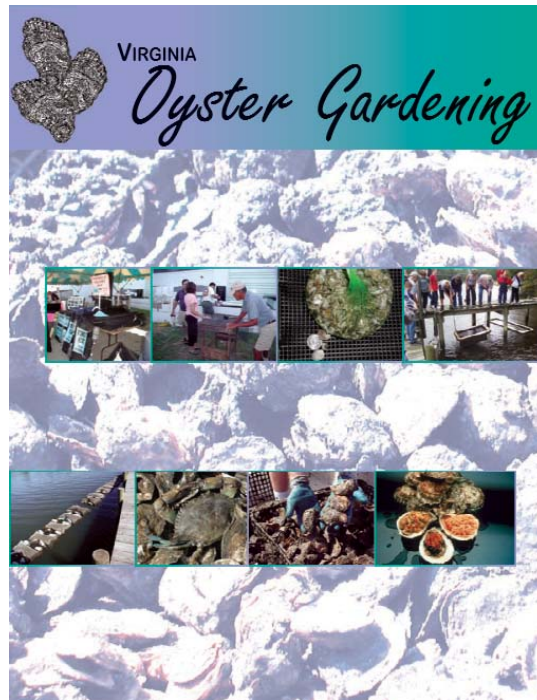
Last spring when the Oyster Reef Heritage Foundation realized they would have some left over grant funds from a NOAA oyster restoration grant, the Virginia CZM staff sat down with scientists, oyster gardeners and oyster resource managers and asked what we could do to help promote the growing interest in oyster gardening. The answer was clear – create a user-friendly, eye-catching guide to growing oysters.

Fortunately we had a great scientific document to start from – *An Introduction to Culturing Oysters in Virginia* written in 1999 by Mark Luckenbach, Francis O'Beirn and Jake Taylor of the Virginia Institute of Marine Science.

As with any kind of gardening, there is a right time for each step, location can be critical and some trial and error may have to be endured before you hit on the best way to "garden" oysters on your waterfront. But as my friends Jeff and Marianne say of their garden near the mouth of the Rappahannock, "It's so easy. We put out our seed in May and served oysters on the half shell for New Year's Eve!"

Well, there's some work involved, but it really isn't too hard. Certainly having a guide book will help the would-be oyster gardener. If only the Walrus and the Carpenter had such a guide!

So what we did was write down, step-by-step what you need to do. It all boiled down to this:



- Step 1.** Evaluate the site.
- Step 2.** Choose a growing strategy.
- Step 3.** Choose a containment system.
- Step 4.** Get a permit. (Yes, you need to do this, but it's for your own safety and it's easy!)
- Step 5.** Purchase supplies.
- Step 6.** Set-up and maintain the garden
- Step 7.** Harvest!

The guide also provides helpful information such as...

- how oyster gardening can help improve your local water quality
- a salinity map showing where oyster growth is possible
- safety tips for consuming oysters (Do be careful, contaminated raw oysters can make you very ill.)
- how best to avoid diseases that can kill oysters
- types of containment systems
- a tear-out permit application
- where to purchase supplies and how much they'll cost
- garden maintenance tips
- how to donate oysters to sanctuary reefs if you don't want to eat them
- what kinds creatures will visit your garden, which ones are beneficial, which are harmful



- 24 website addresses for more information
- 19 email addresses and phone numbers of people who can answer your oyster gardening questions

Although the Virginia Marine Resources Commission has only a few hundred oyster gardening permits on file, it is estimated that there are a few thousand oyster gardens out there.

## It's important to get a permit...

### **First, to protect your own health.**

Many near shore waters are contaminated by human sewage from leaking septic systems or sewage treatment plant outfalls. Filing a permit allows your local health department to track where oysters are being grown and try to ensure that you don't consume raw oysters from contaminated waters.

### **Second, to estimate the positive impacts of oyster gardening on water quality.**

State and federal agencies have been trying for years to restore natural oyster reefs. This is not only for their commercial value, but because oysters filter algae and fine sediment out of the water and the reefs they form create hiding places for young finfish and shellfish. This restoration effort has been fraught with difficulties, so whatever private individuals, as oyster gardeners, can do to help, may have an impact on our overall oyster restoration efforts. So we need to know how many oysters are being grown in order to calculate how much water is being filtered.

### **Third, to help estimate the value of high water quality to people within a particular watershed.**

Because the Marine Resources Commission and Local Wetlands Boards are always reviewing permit applications for projects which may result in a degradation of water quality, it's important to understand how many people may be negatively impacted by permitted activities that could degrade water quality. In that way, these permitting agencies can calculate a more equitable balance between the desires of an individual and the common good.

So, if you, your neighbors, your friends, your employer, or your school have access to some salty or slightly salty water, start an oyster garden! The *Virginia Oyster Gardening* guide is available at [www.deq.virginia.gov/coastal](http://www.deq.virginia.gov/coastal). Or just call us at (804) 698-4122 if you need a paper copy. In the case of oyster gardening, cumulative impacts can be very positive for the environment!



## Omar Arrives in Japan!

*Omar of the Reef, Oyster Heritage Program mascot, has made his debut in Japan!*

*The Virginia CZM Program responded to an email from a Japanese scientist who was thrilled to discover a wild oyster reef in Tokyo Bay! The scientist was eager for information about the value of oyster reefs to water quality and habitat.*

*We received this charming reply.....*

*From: Urara [mailto:urara@biol.s.u-tokyo.ac.jp]*

*Sent: Thursday, February 16, 2006 4:25 AM*

*To: McKay, Laura*

*Subject: Omar has arrived in Japan!*

*Dear Ms. Laura McKay,*

*I can not thank you enough for the kind reply and for sending us materials, bumper sticker and Omar of the Reef tattoo!!!!!! They are so lovely.*

*I was on a business trip, and apologize for not sending reply to you sooner. Thank you so much for answering my question.*

*....what a wonderful thing to discover a live oyster reef in Tokyo Bay!!!*

*Thank you, I too was so surprised when I saw live oyster reef with high diversity of associated fauna in Tokyo Bay, where it is thought to be devastated sea. And not many people are aware of the importance and function of Oyster-reef.*

*We are going to have small Wetland Symposium end of this month, and I will be the overall host.*

*Thanks to the leaflet and the bumper sticker, and the Omar of the reef tattoo, we could be able to introduce wonderful work of Virginia Oyster Heritage Program to Japanese people.*

*I will keep in touch!*

*Sincerely,*

*Urara Takashima  
Zoological Society of Japan*



# Paddling the Seaside

By Laura McKay, Coastal Program Manager

Now's the time to buy yourself a kayak. The weather has warmed, the birds have returned, the dolphins are frolicking and we've created a brand new Internet guide to 38 different routes you can paddle on the seaside of Virginia's Eastern Shore.

This jewel of Virginia's coastal zone is a paradise for paddlers. But be warned – it's also a coastal wilderness, complete with all the dangers, fragility and surprises of a true wilderness.

So why would we want to encourage people to get out there and risk life and limb? For conservation. Yes, for conservation. Although the debates continue ("tourism destroys resources"... "no, ecotourism ultimately protects resources") the Virginia CZM Program is continuing its six year, \$3 million Seaside Heritage Program effort, which does, in fact, include promotion of ecotourism.

As we spend your federal tax dollars appropriated under the Coastal Zone Management Act, we undertake projects that protect and restore coastal resources and that also help coastal-dependent economic activities. So the Seaside Heritage Program with its talented partners from a boat load of federal and state agencies, local governments, universities, Eastern Shore businesses and non-profits, is restoring underwater grasses, oysters, healthy marsh vegetation and shorebird habitat. But we are also working with local industries such as aquaculture and ecotourism to ensure that they have space to thrive.

## Ecotourism takes hold on Eastern Shore

The Eastern Shore of Virginia Tourism Commission has adopted a new strategic plan that strongly promotes ecotourism



*A young kayaker enjoying the site of a Great Blue Heron on one route along the Virginia Seaside Heritage Trail. Photo by Dave Burden, Southeast Expeditions.*



*This floating dock in Chincoteague is one of many to be provided along the Virginia Seaside Water Trail. Photo by Elaine Meil.*

and the Boards of Supervisors in both Northampton and Accomack counties have expressed their support for it. And several businesses have taken hold including Southeast Expeditions which helped create the 38 paddling routes of the Seaside Water Trail. Dave Burden of Southeast Expeditions describes the seaside as "one of those rare places where world class paddling and globally unique wildlife come together."

The key is to help these businesses grow in ways that actually improve natural resources. One way is to be sure, from the start, that our Seaside Heritage Program projects, like the new Seaside Water Trail, are laid out so that paddlers don't come too close to sensitive bird colonies or get in the way of commercial watermen or aquaculture operations.

This is being accomplished through the use of our Geographic Information System (GIS). By mapping the locations of important waterbird colonies and shorebird nesting areas, and even other water uses such as aquaculture and navigation channels, we can lay out paddling routes and provide time of year warnings that will help protect the birds and avoid conflicts with other waterway uses.



Another way to protect the coastal resources is to be sure the public understands why, and when and how birds, dolphins, sea turtles and other wildlife and their habitats can be damaged by human presence. This is being accomplished by creating and handing out brochures such as, *Life on the Beach Isn't Always Easy*, by offering ecotour guide certification—18 guides have been certified and 12 were certified to teach ecotourism certification courses—and by funding the Eastern Shorekeeper and his volunteer assistants who boat around the seaside and engage other boaters in educational conversations about protecting the resources of the seaside.

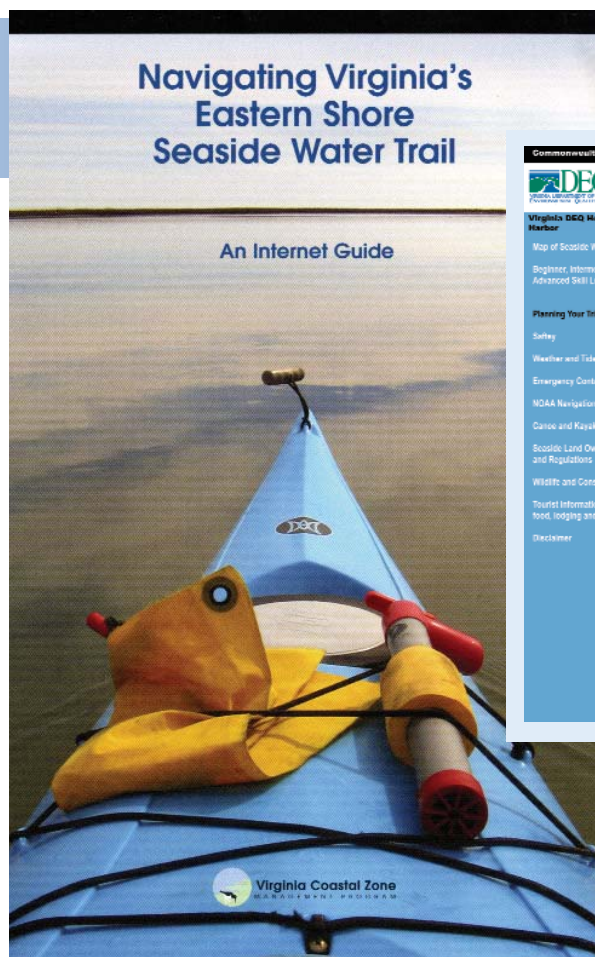
## Seaside Water Trail Completed

Our goal in developing the Seaside Water Trail is also to encourage people to get out and see the beauty of this awesome place. And getting out there in a kayak or canoe is about the least polluting way you can do that. No oil or gasoline leaking out from an internal combustion engine – just your own muscles getting stronger, and your body and mind getting stronger as you absorb the peace and tranquility of these rich, protected waters (well, on a nice, calm day...).

If people don't ever get out and experience nature, will they still value and protect it? Maybe not. Maybe that's one of the many reasons we are losing natural areas at such a fast rate.

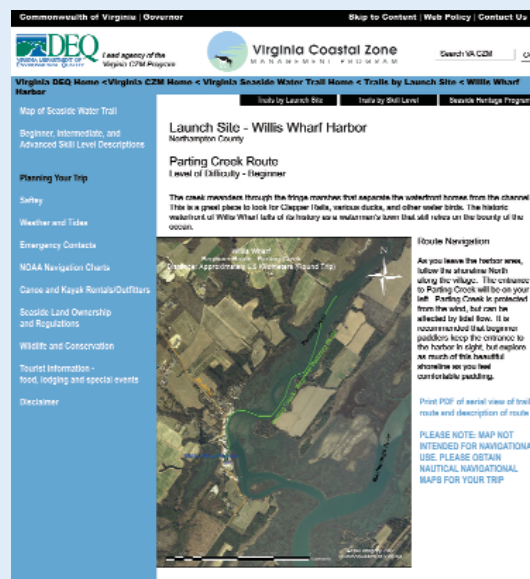
So are you ready to plan a trip? Well get online and go to [www.deq.virginia.gov/coastall/seasidewatertrail/](http://www.deq.virginia.gov/coastall/seasidewatertrail/). All you have to do is click on the boat on the trail map at the spot where you'd like to start, and then you'll see what types of paddling routes are available from that site – beginner, intermediate or advanced. Once you click on your skill level, your route map will pop up on top of an aerial photo of the site. Then you can print it and take it with you. But we warned – this is not a navigation chart. To be extra safe, you should bring a navigation chart with you and always....

- Check the weather
- Check the tides



## Navigating Virginia's Eastern Shore Seaside Water Trail

### An Internet Guide



*The Virginia Seaside Water Trail brochure (left) encourages kayakers to visit the online guide to the Virginia Seaside Water Trail (sample web page above). This on-line guide offers maps and detailed information for all 38 trail routes, and much more to plan and safe enjoyable experience. Cover photo on brochure by Dave Burden, Southeast Expeditions.*

- Let someone know your plans
- Place a 4-foot flag on your kayak so other boaters can see you
- Bring emergency supplies of water, food, bug repellent, sunscreen, flashlight, and whistle before you head out.

The 38 available routes are all terrific, but you may especially enjoy one of the routes out of Wachapreague or Chincoteague where we have installed state of the art, handicapped-accessible "floating docks" which make it very easy to get your kayak in the water. These floating docks also keep you out of the marsh where your footsteps and boat dragging could damage fragile plants. Plus you keep from getting muddy!

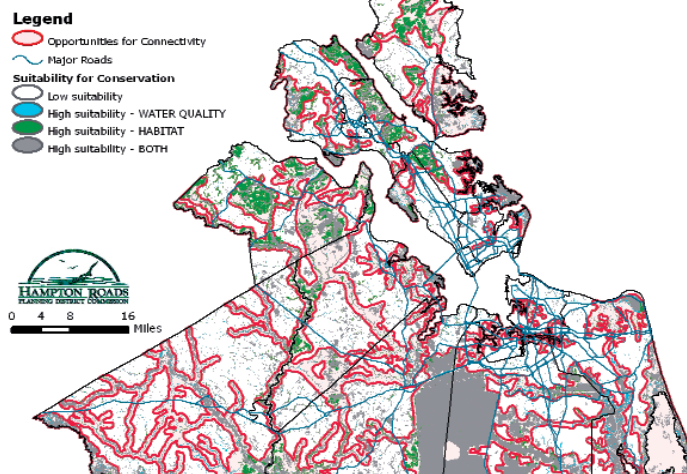
During summer 2006, we are also installing a floating dock in the Village of Willis Wharf. We have worked with the residents there to find the best spot for the dock that will be convenient for kayakers and out of the way of commercial watermen and aquaculture facilities. An observation platform will also be installed there through a CZM grant to the Department of Game and Inland Fisheries and Northampton County. The platform will provide a place for fabulous bird watching across the extensive marshes of Willis Wharf – a truly panoramic, cinematic view. Willis Wharf is already a site on the coastal phase of the Virginia Birding and Wildlife Trail. We hope this project will make it a premier site! 🐦

# NEWS AROUND THE ZONE

## Conservation Corridors Help Define Future Protection in Southern Watersheds

The Hampton Roads Planning District Commission (HRPDC) has recently completed a Regional Conservation Corridor Plan. Conservation corridors are areas prioritized for preservation because of their importance as habitat or for protecting water quality. These areas were previously identified for the southern watersheds area of Hampton Roads (Back Bay, North Landing River and Northwest River) through Virginia CZM's Southern Watershed Area Management Program (SWAMP). The system proved to be a valuable planning tool for the cities of Chesapeake and Virginia Beach and for the state and federal agencies working in the southern watersheds. The corridor system has been used in comprehensive planning efforts, for the creation of a Purchase of Development Rights program in the City of

The Hampton Roads Regional Conservation Corridor System



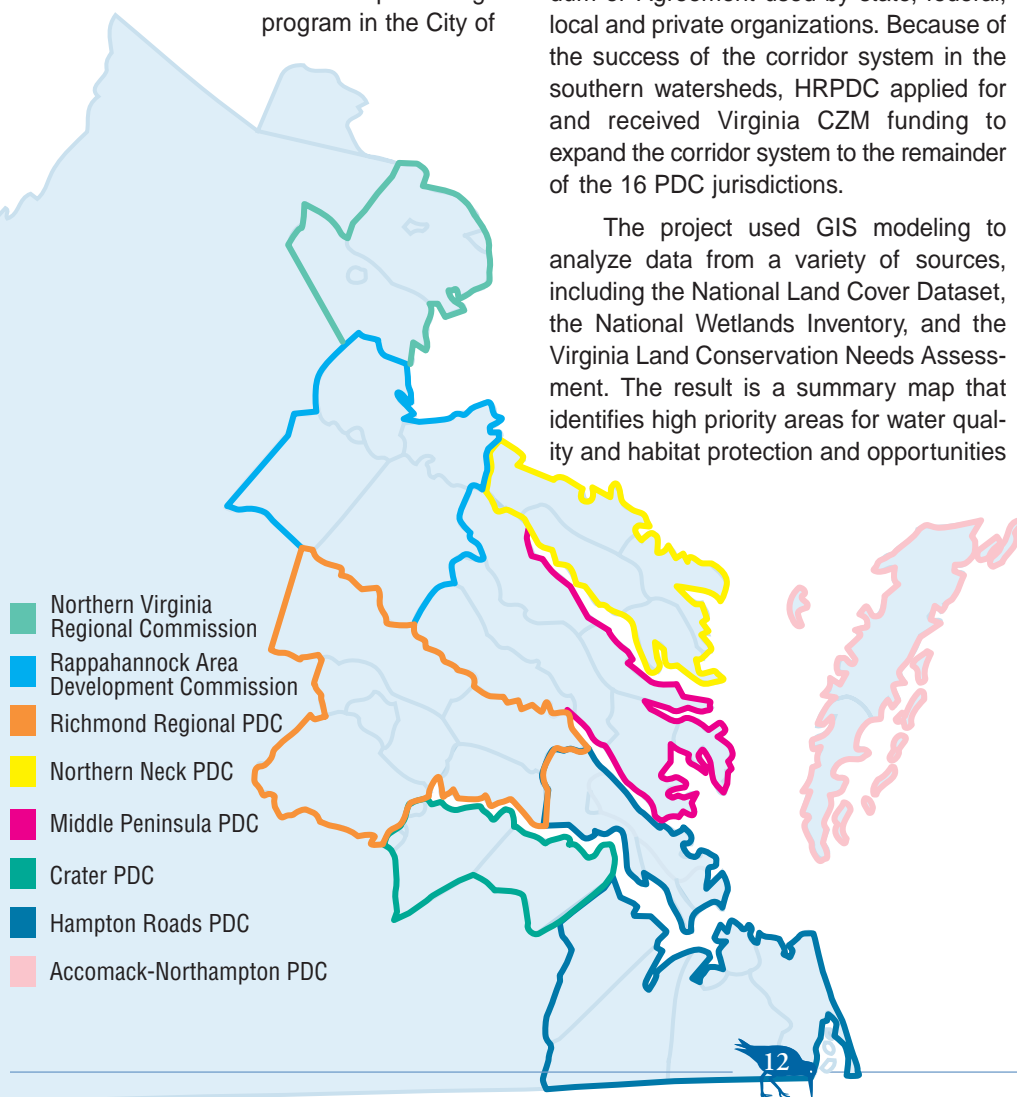
Chesapeake, and is the target area for wetlands mitigation as outlined in a Multiple Benefits Conservation Program Memorandum of Agreement used by state, federal, local and private organizations. Because of the success of the corridor system in the southern watersheds, HRPDC applied for and received Virginia CZM funding to expand the corridor system to the remainder of the 16 PDC jurisdictions.

The project used GIS modeling to analyze data from a variety of sources, including the National Land Cover Dataset, the National Wetlands Inventory, and the Virginia Land Conservation Needs Assessment. The result is a summary map that identifies high priority areas for water quality and habitat protection and opportunities

for connectivity between these areas. Because consensus building was an important part of the project, stakeholders were provided multiple opportunities for involvement as the project progressed. These included discussions at regular HRPDC Joint Environmental Committee meetings, a meeting with a conservation specialist, and meetings with local representatives. Draft maps were also sent to local parks and recreation and planning departments for review and comment.

In addition to GIS products, an educational video on the conservation corridor system was also developed. The video discusses the concept of conservation corridors and encourages business, industry, and individual landowners to help in establishing and maintaining these corridors in their communities. The video will be provided to local governments for use on cable access stations. It may also be useful to other areas of the Coastal Zone interested in developing a corridor system.

The Coastal Policy Team also determined that conservation corridor planning was a priority for Section 309 funding under the Coastal Zone Management Act (see article on page 6). Under the draft strategy sent to NOAA for approval, Virginia CZM could provide up to \$350,000 during the next five years for development and approval of regional conservation corridors and agreements for management of these corridors. —Shep Moon, Virginia CZM Program





## NNPDC Understands the Value of Setting an Example

Setting an example is important to the Northern Neck Planning District Commission staff, particularly when it comes to how they address stormwater issues in their own front yard.

The appearance of unwelcome ponds in the planning district's parking lot after heavy rains was a real problem. It was also an opportunity for a demonstration of how to alleviate stormwater runoff and promote rainwater filtration through low impact development (LID) techniques—vegetated bio-retention basins, rain barrels and buffer strips. The Northern Neck region relies on groundwater to supply 100% of their potable water needs. The project also fit in well with an effort already underway at the PDC to develop a watershed management plan for Cat Point Creek, which promotes the use of LID principles.

The project consists of three vegetated bio-retention basins, with an infiltration trench between the first and second bio-retention basins. The infiltration trench eliminates ponding in the center of the parking lot, and increases water infiltration.

The project includes a filter strip to filter roof runoff between the office complex and a VDOT drainage ditch. Rain barrels were installed on one building and provide water for house plants and shrubs. Another parking lot island was planted with vegetation to provide filtration and aesthetic appeal.

Funding for the watershed management plan and this LID demonstration was provided by the Department of Conservation and Recreation through a grant from the Environmental Protection Agency's Chesapeake Bay Program. Doug Beisch from the Williamsburg Environmental Group designed the project and helped match the EPA grant with pro-bono services. A public workshop to highlight the project and explain LID principles and local implementation was funded through a technical assistance grant from the Virginia CZM Program. Contact Stuart McKenzie at (804) 333-1900 for tours and more information about the project. Signage facilitates self-guided tours. —Stuart McKenzie, Northern Neck Planning District Commission



*A vegetated filter strip and rain barrels were installed at the NNPDC demo project. Photo by Stuart McKenzie, NNPDC*

*In December 2005, the NNPDC received an "Ecological Excellence Award for Construction" for their LID retrofit project sponsored by the Pinelands Nursery and the Soil and Water Conservation Society.*

## Mercury Studies in the Dragon Swamp

Many regional and global environmental water quality issues involve atmospheric transport and deposition of specific pollutants—Virginia's coastal waters are no exception.

Deposition results in acidification of sensitive streams and lakes, eutrophication of coastal waters and, mercury accumulation and toxicity to fish, wildlife and humans.

The effort to control atmospheric pollutant loadings to our coastal waters is further complicated by the size of the airshed which, depending on the contaminant, can be many times larger than the watershed. Local industrial air discharges and sources as far away as the Midwest, particularly coal-fired power plants, contribute to Bay-wide atmospheric mercury loadings.

Exposure to mercury's toxic effects—for the most part from methyl-mercury, a potent developmental neuro-toxin—is primarily through the consumption of contaminated fish. Virginia's Department of Health has issued fish consumption advisories for a number of state coastal waters, including portions of the Dragon Run Swamp/Piankatank River, the Blackwater River and the Great Dismal Swamp Canal. Many of these waters, often referred to as "black water" systems, are considered mercury sensitive due to their relatively low pH, high dissolved organic carbon levels and anaerobic sediment processes. These conditions are conducive for the conversion of inor-

ganic mercury to methyl-mercury, the primary chemical form that bioaccumulates.

With funding from the Virginia CZM and others, scientists have begun studying mercury contamination within the Dragon Run Swamp/Piankatank River area. These studies will lead to development of mercury management strategies.

Involved in this effort are the Virginia Department of Environmental Quality, the Chesapeake Bay National Estuarine Research Reserve in Virginia, VIMS, NOAA's Chesapeake Bay Office, and NOAA's Air Resources Laboratory.

In December 2004, this team installed a National Mercury Deposition Network station in Harcum, Gloucester County. Go to <http://nadp.sws.uiuc.edu> and click on ID number VA98 to see mercury level results.

Atmospheric measurement studies, conducted in the summer of 2005, provided additional information on the various forms of atmospheric mercury—critical to understanding the sources of mercury deposition.



*Atmospheric mercury experimental station in Harcum. Photo courtesy of CBNERRVA.*

Virginia DEQ scientists are monitoring mercury levels at 12 stream sites within the Dragon Run Swamp to identify and reduce any significant mercury sources within the watershed and to quantify atmospheric loadings of mercury to the region.

Efforts and results from these projects will be used to validate mercury atmospheric deposition models for the entire Chesapeake Bay. —William Reay, CBNERRVA

# VIRGINIA'S MARITIME HERITAGE

By Shep Moon, Coastal Planner

Virginia's coastal zone has been host to a number of important chapters in our nation's naval history, but none more significant than the March, 1862 Battle of Hampton Roads. At this point in the Civil War, controlling Southern waterways and ports was extremely important to both the Union and the Confederacy. Control of Hampton Roads, in particular, was critical to Lincoln's blockade of Southern ports and his plans to attack Richmond.

The Union had a far superior navy, but it was stretched very thin with many of its ships unfit for sea or in foreign ports. As a result, few were available to defend the East Coast and blockade the South. The Confederacy, on the other hand, had no real navy and had to rely on hastily converted ships, technological innovations and unorthodox strategies to wage its war at sea.

## The CSS Virginia and Day 1 of the Battle

It's with this backdrop that the CSS *Virginia* appeared. When the Union evacuated its forces from Norfolk early in the war, it burned and scuttled some of its ships to keep them out of enemy hands. The *Merrimack*, a sailing ship with a steam engine and propeller, was raised by the Confederates and converted into a totally new and untested type of vessel – an ironclad.

The CSS *Virginia*, as it was renamed, was a 280-foot long steamship with a crew of 188 men and four inch thick iron plates (crafted at Tredegar Iron Works in Richmond) angled to deflect enemy fire. It also had 10 large cannon (four of them rifled for improved accuracy) and a 1,500-pound iron ram on its bow. Although powerful and imposing, the "dark monster" as some called it, was severely limited in maneuverability with a 23-foot draft and a top speed of only 5 knots.

On Saturday, March 8, 1862, the *Virginia* steamed out of Norfolk on its maiden voyage. Many of its crew assumed this would be a shakedown cruise of the untested vessel, but its captain, Franklin Buchanan, had other ideas. The *Virginia* lumbered straight toward the federal blockade, a line of wooden sailing ships that stretched from Newport News to Fort Monroe.

As the *Virginia* approached, union ships and shore batteries began their attack with shellfire that would have quickly destroyed a normal ship. But to the dismay of the union sailors and the 8,000 federal troops watching from shore, the shells and shot simply bounced off the heavily armored *Virginia* as it moved closer and closer to the fleet.

## The Battle of Hampton Roads

The *Virginia* fired first at the USS *Congress* and then rammed and shelled the USS *Cumberland*. These large sailing ships had much more experienced crews and seven times as many guns as the *Virginia*. In the end, however, they were no match for the *Virginia*'s superior technology and the union vessels sank or burned. The *Cumberland* sank so fast that it almost took the *Virginia* with it because its ram was still stuck in the wooden ship's side. Of the *Cumberland*'s crew of 376, 121 were killed. The *Congress* lost 240 of its crew of 434.

Three federal ships came to help, but all ran aground. Two broke loose, but the USS *Minnesota* remained grounded. The *Virginia* would have destroyed the *Minnesota*, but the tide was falling and so she returned to port with the idea of resuming the slaughter in the morning.

The South had won the arms race, at least for a day. The *Virginia* sank two federal warships in two hours and dealt the U.S. Navy its worst defeat, only to be surpassed 80 years later at Pearl Harbor. The battle was witnessed by tens of thousands of spectators on shore and on other ships, including military observers from Europe. The South had hoped a military victory would encourage France and England to support the Confederacy, in part because European cotton mills were dependent on supplies of cotton from the South and the blockade had caused many hardships abroad.

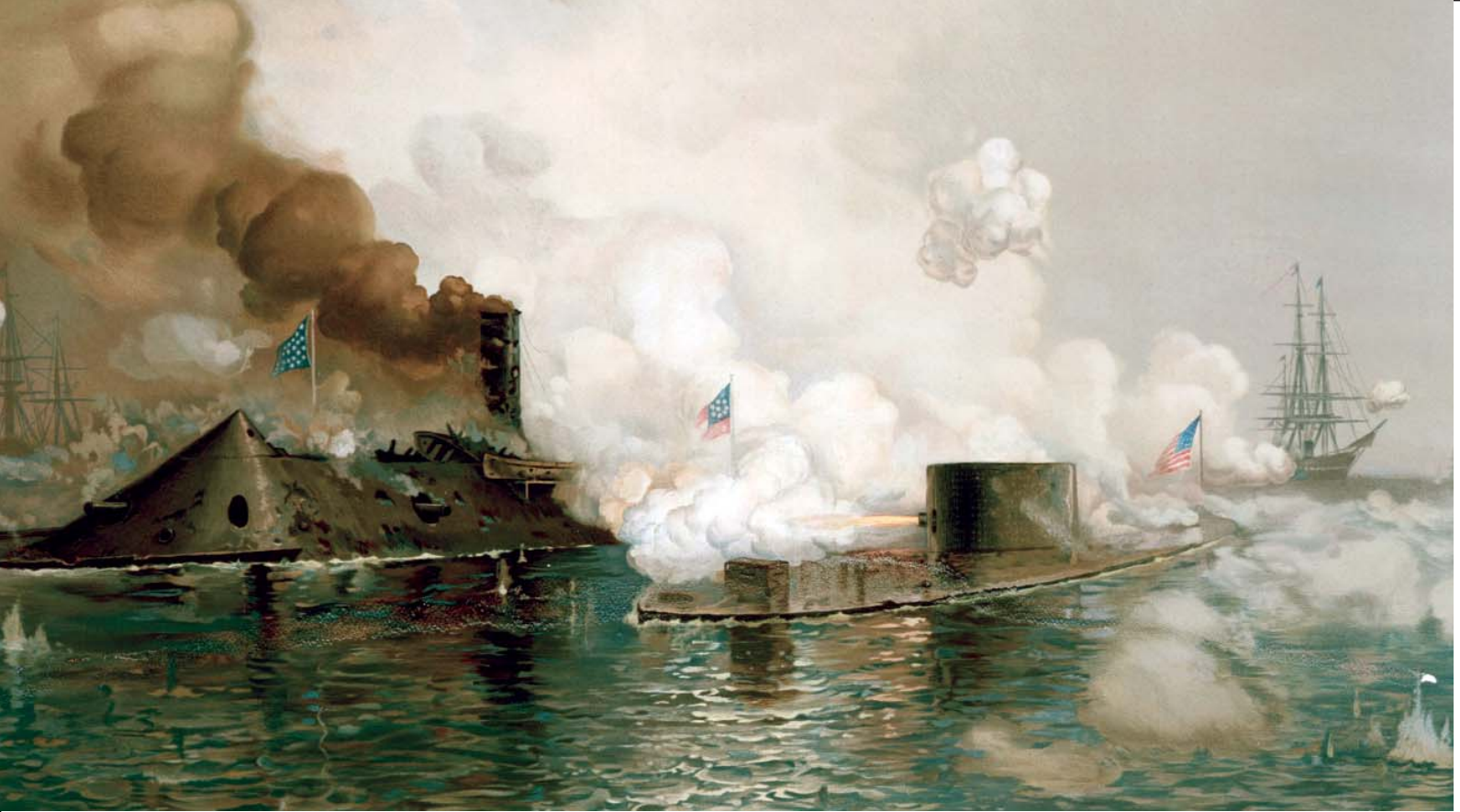
When word of the disaster arrived the next morning in Baltimore, by way of the Old Point Comfort steamer *Adelaide*, panic spread quickly to Washington and New York. Construction of the *Virginia* was well known, and widely dreaded, by the North because of considerable newspaper coverage of its construction. Northerners were afraid that the *Virginia* would sail up the Potomac and level Washington and then attack New York.

## The USS Monitor and Day 2 of the Battle

During the night of March 8, however, the USS *Monitor* steamed into Hampton Roads and anchored beside the stranded *Minnesota*. Hastily constructed, untested, and not designed for the open ocean, the *Monitor* almost sank off the New Jersey coast as it was being towed to Hampton Roads.







*The slugfest between the Monitor and the Virginia lasted only for four hours, but it changed naval warfare forever and may have affected the ultimate outcome of the Civil War (artwork by J.O. Davidson). Courtesy of the The Mariners' Museum, Newport News.*

The *Monitor* was an even more radical departure from traditional warship design with only the pilot house and turret above the deck. Engineering spaces, crew and officer spaces and galley were all below the water line. It was constructed almost entirely of iron and had the world's first rotating gun turret with two large Dahlgren smoothbore cannons. Designed by Swedish-American engineer John Ericsson, it was based on an earlier design Ericsson had presented to Napoleon III of France in 1854. It was built at the Continental Iron Works in New York in only 110 days and was only 174-feet long. Although undersized and outgunned, the *Monitor* was more maneuverable, faster and had a shallower draft than the much larger, but cumbersome, *Virginia*.

On Sunday morning, March 9, the *Virginia* again entered Hampton Roads to finish off the Union fleet. No one watching from shore thought the *Monitor* had a chance. It was remarked that "it looked like a small shingle with a tin can on top." At first, the *Virginia* completely ignored the *Monitor* and focused its attack on the stranded *Minnesota*. The *Minnesota* returned fire to no avail.

Then the *Monitor* moved closer, aligned its revolving turret, and opened fire on the *Virginia*. Although there were other armored ships, most in England and France, none had ever been tested. As the *Virginia* returned fire on the *Monitor*, the world's first "battle of the ironclads" began.

For four hours the battle raged, often at very close range. At one point the *Virginia* rammed the *Monitor*, but was unsuccessful. The *Monitor* was hit 21 times, but managed to fire 43 rounds at its opponent. The *Virginia* eventually found the *Monitor's*

weak spot – its small pilothouse. It scored a direct hit and blinded the *Monitor's* Captain, John Worden. At that point, the *Monitor* steamed into shallow water to regroup. The *Virginia* believed she had given up and was going to attack the *Minnesota*, but the tide was once again too low. Damaged, leaking, almost out of ammunition the *Virginia* went back to port for repairs, coal and ammunition.

## The Aftermath

It is still debated as to which ironclad actually won the battle. Both sides claimed victory. Most historians call it a draw. Many argue, however, that the Union fared better because the *Monitor* neutralized the threat of the *Virginia* and the Union retained control of Hampton Roads. The two Ironclads never fought each other, or any other ship, again. Two months after the battle, Union troops retook Norfolk and the Confederates blew up the *Virginia* to keep her out of enemy hands. Then, on New Year's Eve, 1862, the *Monitor* sank in a gale off of Cape Hatteras while heading to Pamlico Sound, taking 16 men with her.

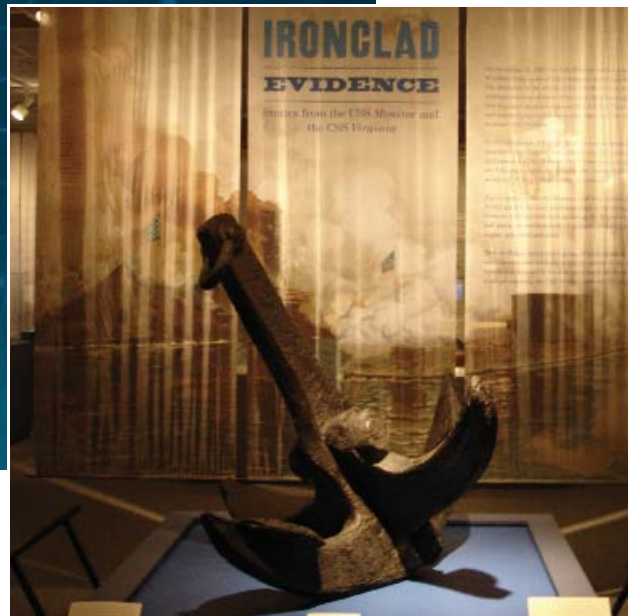
Today, Hampton Roads bears little resemblance, but many reminders, of the March 1862 battle. Sewell's Point, the former Norfolk mooring of the C.S.S. *Virginia*, is now home base to half of the U.S. Navy's aircraft carriers. The Northrup Grumman Newport News Shipyard, along the shoreline where the battle occurred, builds the most advanced warships in the world. And at the Nauticus center the USS *Wisconsin* is moored with its sloped armor and rotating turrets, innovations evolved from the first ironclads. 🐟



# The USS Monitor

...Recovery and Conservation

Telling the Story...



(Above) Remains of the Monitor were located in August 1973 by a Duke University research vessel using sidescan sonar. The wreck lies in 235 feet of water, 16.1 miles south-southeast of Cape Hatteras, North Carolina. Dives in 1979 recovered numerous small artifacts and the ship's unique four-fluked anchor (pictured right) was recovered in 1983. Accelerated deterioration of the wreck was documented during the 1990s and in 1996 Congress mandated that a plan for preserving the Monitor be developed. The union ship's propeller was recovered in 1998 and its turret and cannons were recovered in 2002 during a 41 day joint effort of the Navy and the National Oceanic and Atmospheric Administration (NOAA). Photos from NOAA Monitor Collection.

(Right) Many artifacts, including the anchor, and small personal items, including silverware and condiment bottles are currently on display at The Mariners' Museum in Newport News. Amazingly the mustard jar still contained mustard! Photos courtesy of The Mariners' Museum, Newport News.

## References:

*Ironclad, The Epic Battle, Calamitous Loss, and Historic Recovery of the USS Monitor*; Paul Clancy, McGraw-Hill, 2006.

*Damn the Torpedoes! Naval Incidents of the Civil War*; A. A. Hoehling, John F. Blair, Publisher, 1989.

*National Geographic – Battle of Hampton Roads* p.136; March 2006; [www.ngm.com/0603](http://www.ngm.com/0603).



## Monitor National Marine Sanctuary

On January 30, 1975, the area around the wreck of the Monitor became the first National Marine Sanctuary. The Sanctuary, which includes a vertical column of water one mile in diameter, is managed by the National Oceanic and Atmospheric Administration.

The Marine Protection, Research and Sanctuaries Act, passed by Congress in 1972, authorized the Secretary of Commerce to designate national marine sanctuaries. The goal of the National Marine Sanctuary Program is to protect the marine resources of designated sanctuaries through education and research and by encouraging compatible uses. Thirteen sanctuaries have been designated so far, ranging in size from one to 5,300 square miles. Together they protect a wide range of ecological, historical, recreational and aesthetic resources.

## For more information...

National Marine Sanctuaries – [www.sanctuaries.noaa.gov](http://www.sanctuaries.noaa.gov)

National Marine Sanctuaries – Maritime Heritage Program – [www.maritimeheritage.noaa.gov](http://www.maritimeheritage.noaa.gov)

(Directly Above) The USS Monitor Center, a \$30 million dollar exhibit that includes a full-scale replica of the Monitor, is scheduled to open at The Mariners' Museum in 2007. Photo courtesy of The Mariners' Museum. For more go to [www.marinersmuseum.org](http://www.marinersmuseum.org) or [www.monitorcenter.org](http://www.monitorcenter.org)



# VISIT YOUR COASTAL PUBLIC ACCESS SITES

## Lengthen Your Stay on Newly Renovated Cape Charles Pier

Fishing and bird-watching enthusiasts should especially enjoy the extended access to the Chesapeake Bay on the newly renovated Cape Charles Jetty Pier on Virginia's Eastern Shore. An additional 300 feet has recently been added to the pier bringing its total length to almost 1,790 feet. The expansion includes a right-angled extension into deeper waters for better fishing, a roofed structure toward the center of the pier to provide cover from sun and rain, and special lights aimed downward toward the water to attract fish at night and prevent nocturnally migrating birds from being distracted.

The pier was originally constructed in the early 1990s using funds from the Virginia CZM Program. It is heavily used by the local population and tourists. The new pier is wider and longer. Since the previous pier left about 800 feet of jetty exposed at the far end of the pier, there was always great concern for the safety of those who ventured out for access to deeper fishing waters in the channel.

In addition to \$50,000 in Virginia CZM Program funding and \$50,000 from the Town of Cape Charles, a \$300,000 award from Virginia Marine Resources Commission's Virginia Saltwater Recreational Fishing Development Fund, helped make the pier's facelift possible. To further promote tourism, the Town of Cape



*Photo by Heather Arcos, Town of Cape Charles.*

Charles has purchased a one- year state fishing license, so anyone can fish without needing an individual license.

Attending the ribbon-cutting for the new pier last November were members of the Cape Charles Town Council, Northampton County Board of Supervisors, Eastern Shore of Virginia Tourism Commission, Virginia Marine Resources Commission, Northampton County Chamber of Commerce, Landmark Design – the firm that designed and constructed the pier's addition, and the Virginia CZM Program.

For more information about the renovation of the Cape Charles Jetty Pier, please contact Heather Arcos, (757) 331-3259 or [heather.arcos@capecharles.org](mailto:heather.arcos@capecharles.org).

*–Virginia Witmer, Virginia CZM Program*

## *NOAA Coastal Fellow to Focus on Public Access Projects*

*Only 1% of Virginia's shoreline is publicly owned. Providing residents and visitors with sufficient access to our natural resources is challenging.*

*Over the next two years, the Virginia CZM Program will have help in meeting this challenge. The program was fortunate to receive a NOAA Coastal Fellow who will begin work this August on a cooperative public access project with the program and the Middle Peninsula Planning District Commission. The Fellow's salary will be provided by NOAA and match provided by the Middle Peninsula Public Access Authority.*

*The Fellow, Jacqueline Shapo, will work with state agencies, regional authorities, local governments and NGOs involved in*

*public access, open space and land conservation efforts in Virginia to improve public access information for the entire coastal zone and to encourage nature-based tourism. Jacqueline will consult with these groups on developing new public information tools, including a comprehensive web-based guide to public access and coastal experiences.*

*At the regional level, Jacqueline will work with the Middle Peninsula Public Access Authority to implement a management plan for the authority's first acquisition - a 130 acre site in the Dragon Run acquired with funding from the Virginia CZM Program.*

*Look for more details on these new public access projects on the Virginia CZM website—[www.deq.virginia.gov/coastall](http://www.deq.virginia.gov/coastall)*

# FOCUS ON HISTORIC COASTAL PLACES

## Town's Place Key to Past and Future

By Randy Jones, Department of Historic Resources

West Point is situated on a peninsula where the Pamunkey and Mattaponi rivers join to form the York River. Shown as "Cinquoteck" on Captain John Smith's 1612 "Map of Virginia," West Point was originally the site of an Indian Village. Years before, in 1570, a Spanish expedition of Jesuit priests settled for a short time in the vicinity of Cinquoteck. The village was part of the confederacy of Algonquin Indians, headed by paramount chief Powhatan of the Pamunkey tribe at the time the English settled at Jamestown in 1607.

### Access to Coastal Waters Shapes West Point

In 1646, a treaty with the English restricted the Indians to land upriver and soon after Captain John West was granted 850 acres of land by the Crown and established West Point Plantation. In 1691, the Virginia General Assembly, anxious to develop towns, authorized the purchase of 50 acres of West's plantation to develop a mercantile center and landing for trading ships. Named Delaware Town in honor of John West's father, Thomas West, Earl de la Warr, the town ultimately failed. During the Revolutionary War, however, imported arms and supplies were shipped through the town, and French troops were quartered at the site after the British surrender at Yorktown.

With the advent of the railroad in the early 19th century, commercial interest in the area revived, drawn by the prospect of connecting Richmond to the York River. In 1859 the building of the Richmond & York River Railroad spurred the founding of the new town of West Point in 1860. An iron drawbridge was constructed across the Pamunkey River in 1861 to secure the railroad's terminus at a dock in West Point on the Mattaponi River.

The railroad's timing, however, was ill fated. When the Civil War erupted in 1861, the rail line became a prime military target. In 1862, Major General George McClellan captured the area, putting it under Union control, and in 1863 Union troops burned the fledgling town and the railroad. (Today, only five antebellum buildings exist in West Point.)

### Town of West Point Incorporated

After the war, investors moved quickly to reestablish the railroad. They did so by 1869, and in 1870 West Point was incorporated, with a population of 75. The town flourished. By 1890, it had 2,000-plus residents and was a manufacturing and shipping center. The Town was the fifth largest cotton port in the country,



West Point Historic District and Vicinity

Historic Resources

Map courtesy of Virginia Department of Historic Resources.

exporting 300,000 to 400,000 bales annually. The Baltimore Steamship Company bought the Richmond & York River Railroad, connecting West Point with other important Chesapeake Bay ports. International trade boomed. Huge wharfs were built. Cotton exports continued, and many foreign goods arrived for transport by rail to Baltimore, New York, Boston, and Providence, Rhode Island.

This prosperity, however, came to a grinding halt in 1896 when the railroad terminal—now owned by Southern Railway—shifted to Portsmouth. The effect was devastating. West Point's property values fell as much as 50 percent, and the population declined by 30 percent. Aside from local manufacturing, all that remained of its transportation sector was rail and steamship passenger services.

### Tourism Boosts the Community

The Town was saved from further decline by its reputation as a summer water resort. In 1887, the 200-room Terminal Hotel was built on First Street. The hotel featured a Beach Park with boardwalk, skating rink, dance pavilion, soda fountain, amusement rides and a smaller hotel for additional accommodations.





*Downtown West Point's Historic District (shown mid-1990's) retains its turn of the Century ambiance. Photo courtesy of Virginia Department of Historic Resources.*

Other hotels arose. Excursion trains brought hundreds of visitors to West Point each day, drawn not only by the Town's delicious seafood and artesian waters, but also by 15 bars that had the rare privilege of holding liquor licenses.

Tourism continued into the early 20th century, then declined around 1910 after Beach Park burned. In 1913, the town lost its liquor licenses, and in 1926 another fire destroyed Beach Park's boardwalk and amusement park. There was one exception to this tide of bad economic news. In 1914 the Fox Paper Company, a subsidiary of the Chesapeake Pulp and Paper Company, established a pulp and paper mill. The mill reinvigorated the town's economy, spinning off other manufacturing as well, including factories for pickles, furniture, gloves, and miniature pool-tables. This well-spring of manufacturing provided sustenance to the community through the 1920s and even during the Depression of the 1930s.

## Coastal Access Remains Key to Prosperity

Today, the West Point Historic District, listed on the Virginia Landmarks Register and the National Register of Historic Places in 1996, encapsulates the area's history, revealing a well-preserved turn-of-the-twentieth-century industrial town. The district retains much of the domestic and commercial architectural fabric from the town's boom days. Moreover, because of its riverine border on three sides, the historic district has kept its original physical design.

In 2005, the citizens of the Town began work on a Waterfront Master Plan. Through a series of public workshops, the Town articulated its vision: a dynamic waterfront with public access, tourism and sensitivity toward its natural resources. These characteristics are captured and incorporated in the waterfront planning process by the following Vision Statement:

*"The West Point waterfront is an attractive amenity for residents and visitors alike. It offers a range of activities for people of all ages, and has helped shape the character of the*

## Virginia CZM Funds to West Point Address Stormwater Issues

West Point's Kirby Street lies in the Pamunkey and York River watersheds. High tides and storm events cause regular flooding in this historically industrial section of West Point, which today includes an active railway and logging business. Within this area the Town has identified a waterfront site for Brownfield redevelopment. More than one hundred years of industrial activity have degraded a wetland on the site allowing native vegetation to be crowded out by Phragmites, an invasive weed. The wetland no longer functions as a natural habitat and its ability as a natural filter for stormwater has also been seriously diminished, threatening water quality in the Pamunkey River.

Funding from the Virginia CZM Program has enabled the Town to design a stormwater management plan for the site, which addresses a number of the Town's Waterfront Master Plan Goals. The stormwater management project recognizes the sensitive shorelines of the Pamunkey, the potential for a restored waterfront and sustainable economic development opportunities, including ecotourism. The plan includes restoration of the wetland and construction of an educational marsh walk.

*Town. The waterfront promotes active and passive pursuits in a manner that is compatible with the natural quality of the site."*

To implement this vision for their community, the Town has set out a list of goals and objectives, which guided the creation of zoning/performance standards and two new zoning districts in the waterfront Master Plan—a Conservation District and a Mixed-Use District. Additional Goals are to:

- \* Construct a Riverwalk trail.
- \* Link the waterfront to an historic downtown walking tour.
- \* Build one or more marinas.
- \* Provide opportunities for mixed-use development.
- \* Provide additional recreation activities for residents and visitors.
- \* Include historical and natural interpretation as part of improvements.
- \* Utilize low-impact development techniques for proposed improvements.
- \* Restore and protect natural habitat.

If adopted, the West Point Waterfront Master Plan will promote sustainable development/redevelopment, encourage private investment, preserve sensitive resources, and capitalize on opportunities that are compatible with the Town's vision.

# COASTAL CLIPS & CONTRIBUTIONS

## A New Coastal Planner!

Kelly Price joins the Virginia CZM Program as a Coastal Planner on June 26.



Kelly graduated from Duke University in North Carolina this spring with a Master's in Coastal Environmental Management. While finishing her degree, Kelly worked with the NC Department of Environment and Natural

Resources, Division of Coastal Management where she drafted that state's Coastal and Estuarine Land Conservation Program plan. Prior to this position, Kelly worked as an intern for the North Carolina Coastal Federation, where she prepared a Section 319 Quality Assurance Project Plan for volunteer fecal coliform monitoring and TMDL assessment.

One of Kelly's first assignments with the Virginia CZM Program will be helping prepare Virginia's Coastal and Estuarine Land Conservation Program plan. This plan will be critical to the Commonwealth's continued receipt of funds under this new federal program for land acquisition.

Welcome to the team, Kelly!

## Thank You Julie!

Julie Bixby has left her position as Coastal Planner with the Virginia CZM Program and moved a coast away to sunny Santa Barbara, California. Julie will be helping the City integrate sustainability into their long-range plan.

While with Virginia CZM, Julie made many new friends and great strides on many coastal issues. She was instrumental in helping draft a SAMP for the Dragon Run watershed and acquiring



sensitive habitat in the area; she made inroads in dealing with coastal non-point pollution through her oversight of numerous projects; and, she wrote the proposal to NOAA that lead to the Program's recent receipt of a fellow to address coastal public access issues in the next two years (see page 17.)

We will miss Julie's dedication, enthusiasm and camaraderie!



*Photo courtesy of the American Lung Association of Virginia*

## Virginia CZM Sponsors Clean Commute Day

The Virginia CZM Program supported the 2006 Virginia Clean Commute Day on May 5th. A Clean Commute Day campaign encouraged the public to travel to and from work, school or other locations in modes that reduce air pollution and reliance on a single-occupant vehicle. The event also helps educate the public on the link between clean air and transportation.

The American Lung Association and the Virginia CZM Program have been working together over the last three years to increase the number of Virginians partic-

ipating in the event. Previous media efforts focused on the Northern Virginia and Hampton Roads areas.

This year the Virginia CZM Program funded signs on buses in the Richmond area, as well as radio announcements during Richmond traffic reports. This media project is anticipated to reach 1 million central Virginia residents with a Clean Commute Day message. Perhaps the most important message is that we must celebrate Clean Commute Everyday!

## First Virginia CZM Grantee Workshop Held

At any given time, staff at the Virginia CZM Program manages over 100 active grants to state agencies, local governments, universities and non-profit organizations. Working with grantees to make this process as efficient as possible is critical to meeting NOAA deadlines and reporting requirements.

In February, staff held the first Virginia CZM Program Grantee Workshop to

provide an overview of the grant process to 32 of the program's current grantees and to provide an opportunity for group discussion and feedback on the process. Grantees received a tour of the Virginia CZM Program's comprehensive grants database and received an easy-reference grant procedure manual.

Grants acknowledgement was another important workshop topic. Properly acknowledging the receipt and value of Virginia CZM funds is critical to maintaining federal appropriations under the CZMA. Virginia relies entirely on these funds to maintain its CZM program. Staff unveiled the new Virginia CZM Program logo and discussion focused on how grantees can help improve the program's visibility through proper acknowledgment.

Future grantee workshops will be held if needed. If you are a grantee and would like a binder of workshop materials, please contact Rachel Bullene at [rachel.bullene@deq.virginia.gov](mailto:rachel.bullene@deq.virginia.gov).



## Connecting Students to the Estuarine Environment

"Cool!", "Eew!", "What is that?!" These are some of the exclamations marine science educators at the Chesapeake Bay National Estuarine Research Reserve in Virginia (CBNERRVA) hear as they expose every 7th grade student in Gloucester and Mathews County to the unique wonders of the estuarine environment. The 650 middle school students from these two counties will participate in several classroom sessions on estuarine topics during the school year and spend a full day in the outdoors with CBNERRVA this school year making personal contact with blue crabs, summer flounder and oysters. For some it may be the first time.

In the water and in the classroom, the two educators are addressing Virginia's Life Science Standards of Learning in an applied manner. When the field trip is over the students continue their studies with the help of aquaria set-up in the schools. "We are using estuarine aquaria in the classrooms to extend the impact of the field trips," reported Bob Carroll. "The classroom aquaria are 'micro-estuaries.' The water for the aquaria is collected from the York River as are all the animals." Water quality is the overriding theme to the indoor and outdoor study. Students monitor the temperature, salinity, ammonia, nitrite, nitrate, phosphate, dissolved oxygen and pH levels in their aquaria. Doing so, they not only become familiar with water quality parameters but also more aware of the issue of water quality. "The goal of this project is to link aspects of the estuarine field trips to classroom learning in order to increase the educational value of the program. The teachers and administrators at the four middle schools in Gloucester and

Mathews County have been integral in their work to make this happen," explains Carol.

In their 'micro-estuaries,' students are busy caring for and studying blue crabs, grass shrimp, hermit crabs, feather blennies, naked gobies, Atlantic silversides and spadefish. Although the aquaria at each school were originally stocked with 40 crabs, Carroll reports that the tanks are down to between 4 – 14 crabs. "Students are learning about the importance of habitat and also about population dynamics. The blue crab life cycle, which includes a little bit of cannibalism, is a fascinating lesson for middle school students," Carroll said. The students also perform feeding studies with juvenile summer flounder. "The students couldn't get enough of flatfish species such as hogchokers, tonguefish and summer flounder during our fall field trips," recalls Sarah McGuire, "so we were sure they would love studying them in the classroom."

Oysters are also on the menu – rather lesson. The students are monitoring the growth rates and mortality of oysters in their own oyster gardens in the York River. Each of the four participating schools is growing 4,000 oysters. Watching their oyster gardens grow will eventually become a first hand lesson in restoration as the oysters are placed on a restored oyster reef at the end of the school year.



*Photo courtesy of CBNERRVA.*

Using the lessons they learn working with the students, CBNERRVA will offer free teacher-training workshops in July on the topics of "Estuarine Aquarium Keeping in the Classroom," "Water Quality Workshop for Virginia Educators," and "Aquatic Habitats." Full itineraries can be found at [www.vims.edu/cbnerr/](http://www.vims.edu/cbnerr/), or contact Sarah McGuire ([mcguire@vims.edu](mailto:mcguire@vims.edu); 804-684-7878). –Virginia Witmer, Virginia CZM Program

## NOAA Evaluation Held

NOAA conducted a routine evaluation of the Virginia CZM Program in May. An evaluation team met with federal, state and local staff, academics and others to review how well Virginia is implementing its approved program, adhering to its federal financial assistance awards and being consistent with the Coastal Zone Management Act.

NOAA will issue draft evaluation findings this summer identifying program successes and areas needing improvement. These findings will be made available for public comment on the Virginia CZM website.

## Virginia CZM Agency Receives International Award

The Department of Conservation and Recreation's Natural Heritage Program received the Outstanding Natural Heritage Program Conservation Impact Award at the 2006 NatureServe Annual Leadership Conference.

This is an international award. The Virginia Natural Heritage Program was selected from among 74 programs in the U.S., Canada, Latin American and the Caribbean. Virginia was recognized for its outstanding work in collecting scientific data on the Commonwealth's endangered plants, animals and natural communities, and turning this data into conservation information used by DCR, citizens, students, organizations and agencies across Virginia to effect land conservation. For more information about the award and NatureServe, visit [www.natureserve.org/](http://www.natureserve.org/).



# Virginia Coastal Zone

## M A N A G E M E N T P R O G R A M

### Why a logo after 20 years?

Since 1986, almost every evaluation of our program by our sponsor, NOAA, has credited us for doing great things but also chided our network of agencies for being invisible. It's tough for so many different agencies to appear as a unit. But the need for a clearer identity became paramount last year.

The Virginia CZM Program provided all of the funds for a conference on restoration of Back Bay in Virginia Beach. As one presenter listed all the problems with Back Bay, he said the biggest political problem was that the state CZM program didn't know Back Bay existed. Speaking with him later, he said he knew who our staff was, and that we were at DEQ, and even that we had funded the conference and the multi-year Southern Watersheds Area Management Plan. But he didn't recognize that we are, in fact, the state CZM program. It wasn't until I pointed to the small words "Virginia Coastal Program" under the DEQ logo on the cover of the conference program that he got it. Obviously we needed a logo that said Virginia Coastal Zone Management Program!



We settled on the image of an American Oystercatcher for the new logo. That's because this shorebird is a species of "conservation concern" and Virginia supports the largest number of breeding oystercatchers on the east coast. The adult bird in this photo, taken by Alex Wilke of The Nature Conservancy, was captured and banded as part of a study on survival rates and habitat use. It was breeding in the marshes off Wachapreague and with its mate, was successful in raising one chick the year it was banded.

—Laura McKay, Virginia CZM Program Manager

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